SAMPLE COLLECTOR

This is a division, of application Ser. No. 241,033, filed Apr. 4, 1972, by Louis Franklin Lederer, now U.S. Pat. No. 3,838,719.

This invention relates to sample collectors and more particularly to apparatuses for removing fluid from a body of fluid and depositing portions of the field in different containers.

In one class of sample collectors, each of several different samples of fluid is pumped in succession through an intake hose and a funnel hose and deposited in a different container through a different passageway, with the pump reversing between samples to clear the sections of the hose of fluid, thereby avoiding cross-contamination.

In one type of prior art sample collector of this class, the outlet of the funnel section of hose is mechanically moved over the inlets to the passageways to deposit a different sample of the fluid into each bottle through the passageway communicating with that bottle. The inlets to the passageways are circumferentially-spaced openings in an annular support and the passageways are hoses, each of which communicates at one end with a different one of the circumferentially-spaced openings and at the other end with the interior of a different one of the bottles.

The prior art sample collectors of this type have several disadvantages, such as: (1) the hoses frequently become clogged with solid material from the body of fluid because the intake and funnel hoses are excessively long and, under some circumstances, include bent portions in the funnel hose which are formed as the funnel hose is positioned over certain of the inlets to the passageways; (2) it is difficult to clear the hose of fluid from one sample before drawing another sample because of its length and curved sections; (3) the passageways become clogged because they are long, curved and there is no pump pressure to clear the passageways; and (4) the funnel hose becomes worn after a relatively short period of use because of the frequent flexing of the hose in positioning it over the inlets to the passageways.

Accordingly, it is an object of the invention to provide a novel sample collector.

It is further object of the invention to provide a fluid guiding system for a sample collector, which fluid guiding system is resistant to clogging.

It is a still further object of the invention to provide a sample collector in which the funnel hose is relatively short and relatively straight.

It is a still further object of the invention to provide a sample collector in which it is relatively easy to clear the sections of hose after a sample has been taken.

It is a still further object of the invention to provide a sample collector in which the path through which fluids are guided may be changed from leading to one container to leading to a different container without flexing any hose or moving any container.

It is a still further object of the invention to provide a fluid guiding section for a sample collector that is reliable and inexpensive.

In accordance with the above and further objects of the invention, a sample collector includes an intake hose, a pump, a rotatable funnel, a distributing plate and a compartment for a plurality of bottles.

To distribute the fluid from the distributing section of hose into different ones of the plurality of bottles, the funnel has a large, upwardly-opening circular inlet and a small downwardly extending outlet that is offset from the vertical axis of rotation of the funnel so that it orbits about vertical axis of rotation. The outlet of the funnel hose is always positioned above the rotating circular inlet of the funnel so that the pump forces samples of the fluid from the body of the fluid through the intake and funnel hoses and into the inlet of the funnel, with the outlet of the funnel orbiting about the vertical axis in step-by-step fashion to guide the fluid through the distributing plate into each of the plurality of different bottles below the distributing plate.

To enable samples to be deposited into two circles of bottles, the distributing plate includes: (1) a plurality of inlets positioned in a circle beneath the path of the orbiting outlet of the funnel to receive the fluid from the funnel; (2) a plurality of passageways, each having one end communicating with and a portion extending downwardly and in a generally radial direction from a different one of the plurality of inlets, with alternate passageways extending in different radial directions toward or from the vertical axis of the funnel; and (3) a plurality of outlets, each communicating with the other end of a different one of the plurality of passageways to form two circles of outlets concentric with each other and with the circle of inlets and located on both radial sides of the circle of inlets. The bottles have their open ends positioned under the outlets.

The sample collector of this invention has several advantages, such as: (1) it is resistant to clogging because the sections of hose are short, stationary and coupled directly to the pump so the pressure of the pump forces foreign material from the hose; (2) it is easier to clear of fluid after a sample is taken because the sections of hose are short; (3) it is simple and inexpensive because a molded plastic distributor plate enables multiple concentric circles of bottles to be filled without having to move the outlet of a hose in radial and circular directions; and (4) it is durable because the sections of hoses are not bent or flexed.

The above-noted and further features of the invention will be better understood from the following detailed description when considered with reference to the accompanying drawings in which:

FIG. **1** is a perspective view of a sample collector including an embodiment of the invention;

FIG. **2** is an exploded perspective view of the sample collector shown in FIG. **1**;

FIG. **3** is an elevational view, partly broken away and sectioned, of the sample collector shown in FIG. **1**;

FIG. **4** is a simplified elevational view of an interval timer that is a portion of the sample collector of FIG. **1**; and

FIG. **5** is a block diagram of a control section that is a part of the sample collector of FIG. **1**.

GENERAL STRUCTURE AND OPERATION

In FIG. **1** there is shown, in a perspective view, a liquid sample collector **10**, having a generally cylindrical base **12**, a generally cylindrical cover **14** fitted to the base **12** and a tubular intake hose **16** extending through and depending downwardly from an opening **18** in the upper portion of the base **12**. The base **12** includes a sample bottle tub **20**, a control section **22** conformably fitting over the sample bottle tub **20** and receiving the cover **14**, and a liquid routing section **24**, conformably fitting between the sample bottle tub **20** and the control section **22**, with the control section **22**